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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/770,930	02/03/2004	Roberto B. Nigro	71024-503	1655

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EXAMINER

LOPEZ, FRANK D

ART UNIT PAPER NUMBER

3745

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/770,930

Applicant(s)

NIGRO ET AL.

Examiner

F. Daniel Lopez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/3/04, 2/10/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

***Claim Rejections - 35 USC § 112***

Claims 1-5 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 line 5-7 and claim 5 line 5-7 "a Kurtosis value that is inversely proportional to said surface roughness" is confusing. Murakami et al indicates that kurtosis is the difference between each individual value and an average value, raised to the fourth power, summed over a certain range, divided by a quantity equal to the standard deviation of the points in this range, raised to the fourth power, multiplied by the number of data points in this range (page 2 paragraph 20-21). Since applicant does not specify how kurtosis is calculated, it is assumed that it is calculated by the above formula. As such, there is nothing making the kurtosis value inversely proportional to said surface roughness.

Claims 2-4 are indefinite, since they depend from claim 1.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. § 103 as being unpatentable over Miyazawa in view of Maeda et al, Metals Handbook and CRC Handbook.

Miyazawa discloses a piston assembly comprising a wrist pin (38) receivable in a wrist pin bore (36) of a piston (26) and a wrist pin bore of a connecting rod (40); wherein the

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wrist pin bores have no bushing but have a low friction coating (e.g. 266); and a skirt is formed as one piece with a piston body having the wrist pin bore; wherein the wrist pin has a lay relative to its axis, of approximately 90 degrees; but does not disclose that the wrist pin has an outer surface roughness no greater than 10 microns, a skewness of about -1.0 to 0.0 or a Kurtosis value such that the Kurtosis value times the surface roughness is between about 0.3 microns and 60 microns.

Maeda et al teaches that a wrist pin bore of a piston has a certain surface roughness, attained by grinding the bores (e.g. column 3 line 1-5).

Metals Handbook teaches that a surface roughness, of an element formed by grinding, is less than 6.3 microns (fig 5). Since Maeda et al teaches that the wrist pin bore of a piston is finished by grinding, and since Metals Handbook teaches that a surface roughness, of an element formed by grinding, is less than 6.3 microns; and since two elements of a sliding bearing should have a same or similar surface roughness; it would have been obvious to form the wrist pin of Miyazawa, by grinding, which would thereby have a surface roughness less than 6.3 microns, as taught by Maeda et al and Metals Handbook, as a standard way to finish wrist pins.

CRC Handbook teaches, for a sliding contact bearing, a negative skewness is desired, to average out surface finish errors and to have less wear (e.g. page 11-79), and that the profile having the negative skewness (in fig 11.8.34) would have valleys separated by wide flat planes (e.g. paragraph 2 of page 11-80). A rough calculation of a Kurtosis value of the valleys separated by wide flat planes, result in a value such that the Kurtosis value times the surface roughness is about 2 microns, where the surface roughness is approximately .8 microns.

Since CRC Handbook teaches that a sliding bearing should have a negative skewness, with a profile having valleys separated by wide flat planes; and since the wrist pin is part of a sliding bearing; it would have been obvious to form the wrist pin of Miyazawa, with a negative skewness and with a profile having valleys separated by wide flat planes, as taught by CRC Handbook, as a standard way to finish a sliding bearing. Since a profile having valleys separated by wide flat planes has a Kurtosis

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value times the surface roughness is about 2 microns, where the surface roughness is approximately .8 microns, it meets the limitation concerning the Kurtosis value.

Note that the lay of an element is the direction of its predominant surface pattern. Since the wrist pin is circular, it is cut and finished with a lathe. The direction of the predominant pattern of a lathe is circumferential. Therefore, the lay of a wrist pin is perpendicular to the axis of the wrist pin.

Claim 3 is rejected under 35 U.S.C. § 103 as being unpatentable over Miyazawa in view of Maeda et al, Metals Handbook and CRC Handbook and further in view of Schneider et al. The modified Miyazawa discloses all the elements of claim 3, as discussed in the above discussion of claims 1 and 2; but does not disclose that the coating of the wrist pin bores is manganese phosphate.

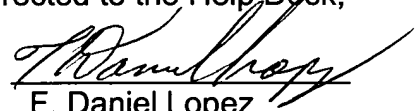
Schneider et al teaches that a wrist pin "may be coated with manganese phosphate or any other coating or flash capable of bearing the load and temperature, to add lubricity and to allow some degree of break-in wear" (e.g. paragraph 14).

Since one of ordinary skill would recognize that the manganese phosphate coating of Schneider et al is equivalent to the low friction coating of the modified Miyazawa, it would have been obvious to replace the coating of the modified Miyazawa with manganese phosphate, as a matter of engineering expediency.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is 571-272-4821. The examiner can normally be reached on Monday-Thursday from 6:15 AM -3:45 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on 571-272-4820. The fax number for this group is (703) 872-9306. Any inquiry of a general nature should be directed to the Help Desk, whose telephone number is 1-800-PTO-9199.



F. Daniel Lopez  
Primary Examiner  
Art Unit 3745  
May 13, 2005